The Office of Environment, Safety and Health and its Office of Nuclear and Facility Safety (NFS) publishes the Operating Experience Weekly Summary to promote safety throughout the Department of Energy (DOE) complex by encouraging feedback of operating experience and encouraging the exchange of information among DOE nuclear facilities.

The Weekly Summary should be processed as an external source of lessons-learned information as described in DOE-STD-7501-96, *Development of DOE Lessons Learned Programs*.

To issue the Weekly Summary in a timely manner, the Office of Operating Experience Analysis and Feedback (OEAF) relies on preliminary information such as daily operations reports, notification reports, and, time permitting, conversations with cognizant facility or DOE field office staff. If you have additional pertinent information or identify inaccurate statements in the summary, please bring this to the attention of Dick Trevillian, 301-903-3074, or Internet address dick.trevillian@hq.doe.gov, so we may issue a correction.

Readers are cautioned that review of the Weekly Summary should not be a substitute for a thorough review of the interim and final occurrence reports.

Operating Experience Weekly Summary 97-08

February 14 through February 20, 1997

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The Weekly Summary is available, with word search capability, via the Internet at **http://www.tis.eh.doe.gov/web/oeaf/oe_weekly/oe_weekly.html**. If you have difficulty accessing the Weekly Summary at this URL, please contact Mark Mortensen at 208-525-3753 for assistance.

EVENTS

1. VIOLATION OF WORK CONTROL PROCEDURES

On February 12, 1997, at the Los Alamos National Laboratory (LANL) Tritium Salt Facility, an occurrence investigator reported that subcontractor personnel violated work control procedures that resulted in bypassing the normal environment, safety, and health review for a job package. On February 6, the subcontractor used a Priority 1 work ticket to perform tests on a fire alarm panel. A Priority 1 work ticket is used only for emergency work addressing probable injury to personnel or significant property damage. Priority 1 tasks do not require environment, safety, and health reviews. The facility manager subsequently determined that the task was not emergency work and the Priority 1 status was incorrectly used. There was no effect on the environment or the health and safety of personnel as a result of this event. Performing work without appropriate reviews could increase the risk of personnel injury or release to the environment. (ORPS Report ALO-LA-LANL-TSF-1997-0001)

On January 16, 1997, Security and Operations personnel told Audits and Assessments Group personnel they would resolve concerns raised during a 1990 internal audit by February 10, 1997. One of the audit findings involved the slight possibility of losing an alarm signal between the fire alarm panel and the central alarm station. Facility workers could reduce the probability of signal loss by making a few minor modifications to an interface panel between the fire panel and central alarm station. On the morning of February 6, fire protection personnel instructed the subcontractor work planners to issue a work ticket. They told the contractors to schedule the work for the same day so the February 10 deadline could be met. To ensure that the task was completed as requested, the planners issued a Priority 1 work ticket that allowed subcontractors to test the operation of the interface between the fire panel and the central alarm station.

On the afternoon of February 6, the deputy facility manager reviewed the work ticket and questioned the nature of the emergency. However, he granted permission for workers to perform the work described on the work ticket without prior facility management review because it was coded as Priority 1. Facility managers understood Priority 1 work tickets were for emergencies only.

On February 12, the facility manager designee convened a critique of the event and determined the work control process was violated because the Priority 1 status was inappropriately used. Bypassing the environment, safety, and health review could have resulted in an adverse effect on personnel safety. Facility personnel are developing a work control process policy that will provide new definitions for work ticket priorities. This policy will be disseminated to all facility work groups.

An event with similar causal issues, but more tragic consequences, occurred at the Tritium Salt Facility on January 17, 1996. A mason tender received a severe electrical shock that resulted in serious burns and cardiac arrest. The mason tender was excavating in a building basement when the jackhammer he was operating contacted an energized 13.2-kV electrical cable. (Weekly Summaries 96-04 and 96-05; Type A Accident Investigation Board Report on the January 17, 1996, Electrical Accident with Injury in Building 209, Technical Area 21, Los Alamos National Laboratory; ORPS Report ALO-LA-LANL-TSF-1996-0001)

A Type A Accident Investigation Board identified numerous issues associated with the accident, including the following.

- LANL workers used an inappropriate work order for the excavation. Major construction activities, such as the basement excavation, should have been accomplished under a detailed specialized work order. Instead, a standing work order for routine maintenance tasks was used. According to administrative procedures, standing work orders do not require environment, safety, and health reviews because they are for routine, repetitive, non-complex tasks.

- LANL personnel incorrectly interpreted the applicability of excavation permits. They incorrectly assumed that excavation permits were not required for work inside buildings. As a result, safety engineers were not given the opportunity to identify hazards associated with the excavation.

- Actions taken by LANL management were driven by time constraints to meet Environmental Protection Agency deadlines for the completion of facility modifications. Ad hoc procedures were created to expedite the project and the environment, safety, and health review of project tasks. This ad hoc process was never formally approved by LANL senior management.

These events underscore the importance of effective work control programs for planning work. DOE-STD-1050-93, *Guideline to Good Practices for Planning, Scheduling and Coordination of Maintenance at DOE Nuclear Facilities*, section 3.1.1.3, provides the key elements of an effective planning program. Included is guidance on consistency in planning between disciplines to avoid confusion and frustration of work groups. The standard also discusses the need for thorough reviews of work packages by experienced individuals to eliminate errors. Section 3.1.2 states that a priority coding system for maintenance job requests should be established and provides guidance on different priority codes. Managers at DOE facilities should review their planning programs and policies to ensure consistency with the guidance in the standard. This guidance should be processed as an external source of lessons-learned information as described in DOE-STD-7501-96, *Development of Lessons Learned Programs*. Corrective actions developed as a result should be periodically reviewed by cognizant management to ensure they remain effective and properly implemented.

KEYWORDS: fire alarm, test, work package

FUNCTIONAL AREAS: work planning, fire protection

2. WELDING AND CUTTING ACCIDENTS

Operating Experience Analysis and Feedback (OEAF) engineers reviewed two occurrence reports this week involving welding and cutting accidents. In the first event, a welder received an electric shock and puncture wound when he accidentally came in contact with a welding electrode. In the second occurrence, a welder was fatally burned when his anti-contamination clothing caught fire. Although welding and cutting are routine activities associated with equipment repair, construction, and demolition, they can be dangerous. Welding and cutting events have resulted in fires, personnel injuries, and fatalities. (ORPS Reports SR--WSRC-HCAN-1997-0008 and ORO--LMES-K25GENLAN-1997-0001)

On February 11, 1997, at the Savannah River Site, a welder was repairing a condensate header with a tungsten inert gas welder. He was lying on his back in the overhead piping.

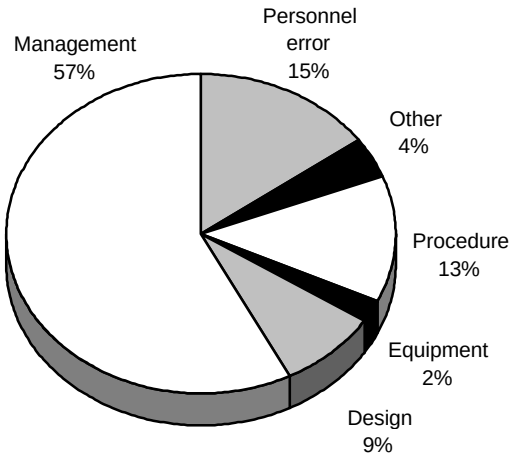
When the welder completed the weld, he laid the electrode tip down beside him and asked his assistant for a grinder to grind the weld. While adjusting his position to gain access to the weld, the welder's right arm came in contact with the electrode tip, and he received an electrical shock. The welder immediately called out to the assistant, "unplug it," and the assistant unplugged the grinder, believing it was shorting out. When the electrical current did not stop, the assistant had personnel below unplug the welding leads to stop the flow of electricity.

The control room supervisor requested medical assistance. Emergency medical technicians responded and removed the welder's respirator, checked his vital signs, and lowered him from the overhead piping. They transported him to a hospital where medical personnel determined that his condition was stable. The welder remained in the hospital overnight for observation and returned to work the next day.

Investigators determined that the welder did not maintain positive control over the electrode tip. When welders must set an electrode down, they can (1) shut the welder off, (2) retract the electrode tip, (3) hand the electrode to an assistant, or (4) place it far enough away that it cannot be touched accidentally. Facility personnel are reviewing the last action to determine its effectiveness. Investigators determined the welder believed he had set the electrode far enough away before he changed position. The welder was wearing two pairs of protective clothing, an air-supplied respirator, welding hood, and leather gloves, but the electrode burned through his protective clothing to the skin.

On February 13, 1997, at the Oak Ridge K-25 Site, a welder was fatally burned. His two layers of anti-contamination clothing and coveralls caught fire, engulfing him in flames. All of the clothing was cotton. Investigators have not determined the exact source of ignition. Facility personnel are investigating the rapid burning of the anti-contamination clothing and coveralls. A DOE Type A accident investigation is in progress in accordance with DOE 225.1, *Accident Investigations*. OEAF engineers will follow the investigation and provide lessons learned in a future Weekly Summary.

OEAF engineers reviewed the Occurrence Reporting and Processing System (ORPS) database for all reports involving welding and cutting operations that resulted in injury or fires. Figure 2-1 shows facility managers reported management problems as the root cause for 57 percent of these events. Seventy percent of the management problems were the result of work organization/planning deficiencies or policies not adequately defined, disseminated, or enforced. Facility managers reported that 21 injuries resulted from these events. Figure 2-1 includes a breakdown of the types of injuries caused by torches or welding.



Type of Injury	Percent
Toxic fume inhalation	50
Burns	35
Shocks	10
Multiple injuries	5

Figure 2-1. Distribution of Root Causes for Welding and Cutting Accidents with Breakdown by Types of Injuries[1]

These events illustrate the potential dangers involved in welding, cutting, and grinding activities. Welding may not always be performed in ideal locations or in non-combustible enclosures, and welders may have to work in confined areas, making movement and positioning difficult. Burns of the eye or body are serious hazards of welding. To prevent these injuries, protective equipment should be worn that is appropriate to the specific welding activity. Welding shields and helmets protect workers' eyes and faces from infrared or radiant light burns, flying sparks, metal spatter, and slag chips. Fire prevention is another important consideration. Open flames, electric arcs, hot metal, sparks, and spatter are ready sources of ignition. Many fires are started by sparks that pass through small openings such as cracks or holes. A fire watch, trained in the use of fire extinguishing equipment and the facilities available for sounding a fire alarm, is a necessary element of fire protection. Hot-work permits are useful when welding or cutting in areas not normally reserved for such operations. The hot-work permit alerts personnel in the area of the fire risk associated with the welding or cutting. Permits should be limited to short periods of time and one welding operation. Several publications provide guidance on welding and cutting safety and reducing fire hazards. Following are publications that contain many general and specific recommendations that should be consulted by appropriate facility personnel.

- DOE/EH-0196, *Fire Prevention Measures for Cutting/Welding Activities*, Bulletin 91-3, 1991.

- *Industrial Fire Hazards Handbook*, 3rd ed., National Fire Protection Association, 1 Batterymarch Park, P.O. Box 9101, Quincy, Massachusetts, 1990.

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1 OEAF engineers screened the ORPS database for reports using narrative torch+weld+welding, excluding root and contributing cause codes 1B, and excluding nature of occurrence codes 1D, 1G, 2A-D, 3B, 4A, and 4B. A 100 percent review of these reports yielded 48 occurrence reports. The screening process eliminated events involving failed welds, fire protection system actuation, and contamination issues.

- *Cutting and Welding Processes*, Standard 51B, National Fire Protection Association, 1 Batterymarch Park, P.O. Box 9101, Quincy, Massachusetts, 1992.

- *Brazing Safely*, American Welding Society, Miami, Florida, 1992.

- *Arc Welding Safely*, American Welding Society, Miami, Florida, 1988.

- *Oxyfuel Gas Welding, Cutting, and Heating Safely*, American Welding Society, Miami, Florida, 1992.

- *Safe Practices*, American Welding Society, Miami, Florida, 1992.

- *Safety in Welding and Cutting*, ANSI/ASC Z49.1-1988, American Welding Society, Miami, Florida, April 5, 1988.

KEYWORDS: welding, shock, burn, fire, fatality, anti-c clothing

FUNCTIONAL AREAS: industrial safety, mechanical maintenance, construction

3. WORK IN ENERGIZED RACK CAUSES CAPACITOR DISCHARGES

On February 11, 1997, at the Los Alamos National Laboratory Dynamic Experimentation Facility, a technician violated a standard operating procedure and caused a capacitor to discharge three times when he started to work on a high-voltage connector in an equipment rack without de-energizing it or grounding the capacitor. The technician was not shocked or injured, and there was no equipment damage. Investigators believe the design of the high-voltage connector isolated the operator from electric shock because the handle of the connector sparks to ground inside the chassis. Failure to follow safety procedures when working with high-voltage equipment and capacitors has resulted in electric shock and equipment damage. (ORPS Report ALO-LA-LANL-FIRNGHELAB-1997-0002)

Experimenters were preparing to perform a test to determine if higher voltage would increase energy in an accelerator. The technician, who was knowledgeable and experienced with the equipment, planned to replace a power supply and capacitor bank in the equipment rack with a higher-voltage one. This activity required him to work in the equipment rack. The facility standard operating procedure states: "prior to performing any operation within a rack, the main circuit breaker in the rack will be turned off and all capacitors shorted with the grounding hook." The technician failed to perform either protective action before he tried to pull the high-voltage connector from a receptacle. He immediately heard the noise from an arc and saw two subsequent arcs from the power supply to the connector. He opened the main circuit breaker to the rack after the discharge, when he realized he overlooked this step before starting work.

The operations coordinator conditionally suspended test activities, pending a critique, to ensure that all measures were considered before resuming the test. On February 12, 1997, the facility manager designee conducted a critique of the event. Critique members determined that the standard operating procedure was adequate and, if followed, would have prevented the event. A subsequent review of the procedure confirmed this conclusion. They discussed the adequacy of the procedural guidance and the value of engineering controls versus administrative controls. They also discussed the feasibility of

installing interlocks to prevent work on the rack while it is energized. Facility engineers are evaluating this option. Critique members directed that a conspicuously placed light be installed as a visual aid to inform operators when the system is energized. Workers installed the light on February 13.

This event demonstrates the importance of multiple, engineered barriers to prevent hazardous events such as electrical shocks or discharges. Although human performance supported by procedures, policies, memoranda, or standing orders is a standard barrier to prevent electrical shock events, the probability of prevention can be increased by adding barriers. According to the hazard-barrier matrix in the *Hazard and Barrier Analysis Guide*, developed by the Office of Operating Experience Analysis and Feedback (OEAF), flashing lights are somewhat effective in protecting against high-voltage and current sources. Adding a physical barrier, such as an interlock, to prevent access to energized equipment would provide an additional margin of safety.

OEAF engineers reviewed the Occurrence Reporting and Processing System (ORPS) database for electrical shocks or near-misses and found 235 events across the DOE complex. Personal error was the direct cause of 41 percent of these concerns. The high percentage of personnel errors reinforces the value of additional barriers to supplement human performance. Figure 3-1 depicts the distribution of the direct causes.

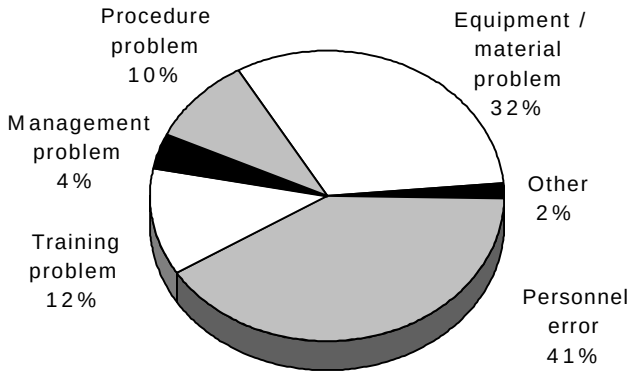

Figure 3-1. Direct Cause of Personal Safety Concerns Involving Electric Shocks[1]

NFS reported on electrical shocks from capacitive devices in OE Weekly Summaries 96-04, 96-34, and 96-51. OE Weekly 96-51 reported an event on December 5, 1996, at Sandia National Laboratory, where a technician at the Explosives Component Facility received an electrical shock when his right hand came close to a high-voltage bank of capacitors. The discharge path through his body was from the bottom of his right wrist to his elbow at the point where it was in contact with the grounded metal chassis. The technician was working with another technician and a test engineer to repair a neutron

[1]OEAF engineers screened the ORPS database for Nature of Occurrence “03A (occupational illness/injuries) OR 03C (personal safety concerns) OR 10@ (cross category items including near-misses) and for the Narrative "elec@" AND "shock@" and found 207 reports describing 235 occurrences. Based on a random sample of 30 reports, OEAF engineers determined that each slice is accurate within ± 1.2 percent.

controller for an explosive tester. He was not wearing the protective equipment required for work on energized high-voltage systems. (ORPS Report ALO-KO-SNL-14000-1996-0004)

These events underscore the need for workers to be aware of the stored electrical energy and shock hazard of capacitive discharge. Workers can be shocked from charged capacitors even if the equipment has been turned off or disconnected from external power. In the February 11 event, the capacitor discharged three times, indicating a sustained discharge. According to DOE-HDBK-1011/2-92, *DOE Fundamentals Handbook Electrical Science*, volume 2, the time it takes a capacitor to charge or discharge is called the capacitive time constant. The capacitive time constant is the time for the capacitor to charge or discharge to 63.2 percent of its fully charged voltage. The time constant (in seconds) can be calculated as the resistance of the circuit (in ohms) times the capacitance of the capacitor (in farads). For a circuit with a 1,000 microfarad capacitor and 500 ohms of resistance, the capacitive discharge time would be 0.5 seconds. It takes five time constants for a discharging capacitor to drop to its minimum value.

Facility managers should review the OSHA regulations contained in 29 CFR 1910, sub-part S, "Electrical" 29 CFR 1926, sub-part K, "Electrical"; and 29 CFR 1926, subpart V, "Power Transmission and Distribution." The regulations in 29 CFR 1910.147(d)(5) and .333(b)(2) require discharging, short-circuiting, and grounding capacitors if the stored electric power could endanger personnel. The section includes descriptions of capacitors, circuit diagrams, and electrical equations.

A copy the *Hazard and Barrier Analysis Guide* is available from Richard Trevillian, (301) 903-3074. Managers and supervisors should review the guide and incorporate hazard and barrier analyses in work and operation processes.

KEYWORDS: capacitor, panel, electrical

FUNCTIONAL AREAS: industrial safety, electrical maintenance

4. ARGONNE NATIONAL LABORATORY DEVELOPS PROCESS MONITORING AND FAULT DETECTION SYSTEM

Operating Experience Analysis and Feedback engineers recently reviewed a report about Argonne National Laboratory's artificial-intelligence-based process monitoring and fault detection system. The DOE Office of Nuclear Science and Technology sponsored development of this new computer-based system, known as the Multivariate State Estimation Technique (MSET). The MSET proactively monitors plant parameters to detect equipment, sensor, or operational disturbances before plant conditions degrade enough to warrant corrective action. As part of the Department's effort to transfer innovations from DOE laboratories to U.S. companies, Argonne National Laboratory managers and their counterparts at a public utility agreed to install the monitoring system at a commercial nuclear power plant to demonstrate its performance in operating facilities. Engineers are also testing MSET to monitor sensors on space shuttle engines through an agreement between a commercial company and the National Aeronautics and Space Administration.

The MSET system resulted from 8 years of research at Argonne. The system is streamlined for computational efficiency and will operate on standard Pentium-processor personal computers. The MSET can be used to detect degradation on any sensor under surveillance. The system generates a synthesized signal that automatically masks out the

degraded signal for correlated variables in the system. Argonne researchers demonstrated that the "virtual" signal typically follows the "real" signal to within ±0.1 percent accuracy. This feature may reduce unscheduled commercial nuclear plant shutdowns in non-sensitive, Nuclear Regulatory Commission (NRC) approved cases.

The actual and potential uses of MSET include the following.

- The system is used at the Argonne National Laboratory-West Fuel Conditioning Facility to analyze the validity of signals from the electrorefiner (the electrorefiner conditions fuel removed from Argonne-West Experimental Breeder Reactor II).

- The system that detects Venturi flowmeter fouling could insert a synthesized signal that represents the true flow rate in pressurized water reactors. Venturi flowmeter fouling is an industry-wide problem that typically costs approximately $7 million per year in lost revenue for the average pressurized water reactor.

- Loss-of-time-response failures could be detected in certain pressure transmitters. Operators would receive an early warning, and a synthesized signal could be inserted for the remainder of the operating cycle. Loss-of-time-response failure is an industry-wide problem, and NRC engineers have not identified a real-time surveillance system that can detect this failure mode. Argonne researchers recently demonstrated that MSET can detect loss-of-time response failures with high reliability using archived data from actual failures.

- The calibration status of sensors is typically checked only during 18-month or 24-month refueling outages at nuclear plants. MSET could provide continuous calibration validation throughout a plant's operating cycle for all plant sensors.

The Argonne MSET has received widespread interest from the manufacturing, transportation, aerospace, robotics, and financial-analysis industries. For more information regarding MSET, contact Kenny Gross at (630) 252-6689, or Ralph Singer at (630) 252-6723.

KEYWORDS: calibration, monitoring

FUNCTIONAL AREAS: instrumentation and control, research and development

5. TANK DRAINING HALTED BECAUSE OF INADEQUATE PROCEDURE

On February 12, 1997, at the Rocky Flats Environmental Technology Site, process specialists draining plutonium nitrate solution from a process tank found a valve in the wrong position while sparging the tank. The valve was not identified in the procedure for draining the tank. Sparging is a criticality evaluation required step needed to mix the solution before sampling and draining. Because the valve was open, it decreased the vacuum in the system, affecting the quality of the sparge. The evolution supervisor declared the sparge unsuccessful and terminated the operation. Process specialists placed the system in a safe configuration with the concurrence of a criticality engineer.

This procedure inadequacy affected the sampling and movement of solutions that have criticality safety implications. (ORPS Report RFO--KHLL-771OPS-1997-0009)

Process specialists were performing tank draining activities in accordance with a new procedure prepared for this activity. When they performed the procedure for sparging the tank, the evolution supervisor noticed the tank was not exhibiting typical indications of proper sparging. He sent several process specialists to walk down the vacuum lines and check valve positions. The specialists found an open valve on a vacuum line that allowed vacuum to pull on another glovebox, thus reducing the sparge. When they checked the system drawings they found the valve was not included in the initial valve lineup described in the procedure. Successful completion of the procedure required a procedure change to allow the specialists to close the previously unidentified valve. The supervisor determined that a document modification request was needed to change the procedure.

The facility manager held a fact-finding meeting. Participants in the meeting raised concerns about the tank sparging steps in the procedure. They also identified a previous unreviewed safety question determination concerning vacuum header lineups for raschig-ring infracted tanks that required vacuum/vent valves to be locked in the vent position. Process specialists walked down the vacuum header and verified that all valves were in the correct position. The evolution is on hold pending procedure modification and validation.

Investigators determined that this occurrence was the result of an inadequate review of system drawings and a less-than-adequate walk-down of the system during development of the procedure. Initial corrective actions include modification of the procedure to include the unidentified valve and validation of the procedure.

NFS reported inadequate procedure events in Weekly Summaries 97-04, 96-48, 96-39, 96-34, 96-24, 96-19, 96-17, 96-14, 96-11, 96-08, and 96-04. Weekly Summary 96-46 reported a November 5, 1996, event at the Savannah River Site. An emergency shutdown of an incinerator resulted when an operator closed a drain valve, causing water to fill a quench vessel and block the off-gas flow. The operator implemented an incorrect procedure step when he closed a drain valve that should have remained open. The procedure could have caused equipment damage. Investigators determined that the procedure for transferring quench water from the quench tank improperly included a section requiring the quench recirculation tank to be drained. (ORPS Report SR--WSRC-CIF-1996-0029)

These events underscore the need for procedure writers to perform accurate reviews of system drawings to ensure that all components necessary to safely perform the evolution are included. Procedure users should perform a walk-through of the procedure to determine workability, human-factors considerations, and proper system and equipment lineups. This verification and validation process will help to identify omissions, incorrect positions, and other errors before procedures are authorized for operational use. This is especially important when working with systems containing fissile solutions. A valve omission or incorrect alignment could result in an inadvertent transfer of solutions, vacuum being applied to unintended locations, or interference with vent/purge paths for tanks with hydrogen generation concerns.

DOE 5480.19, *Conduct of Operations Requirements for DOE Facilities*, chapter XVI, “Operations Procedures,” states that procedures provide direction to ensure that the facility is operated within its design basis. The Order also states that procedures should be effectively used to support safe operation of the facility. Attention should be given to writing, reviewing, and monitoring operations procedures to ensure the content is

technically correct and the wording and format are clear. As stated in the Order, "procedures should be developed for all anticipated operations, evolutions . . . and . . . should provide administrative and technical direction to conduct the intent of the procedure effectively. Sequence of procedural steps should conform to the normal or expected operational sequence."

DOE-STD 1029-92, *Writers Guide for Technical Procedures*, provides guidance to assist procedure writers in producing accurate, complete, and usable procedures that promote safe and efficient operations. Inputs to procedures should be obtained from operators and training personnel. Section 2.3, "Facility Configuration," requires walk-downs, simulations, modeling, or desk-top reviews to ensure technical accuracy and adequacy of procedures. Both new and revised procedures should be reviewed before issuance to ensure that the information, instructions, and cautions are technically accurate.

KEYWORDS: procedures, validation, criticality safety

FUNCTIONAL AREAS: procedures, operations, nuclear/criticality safety

OEAF ACTIVITY

1. OPERATING EXPERIENCE ANALYSIS AND FEEDBACK HOME PAGE

The Office of Operating Experience Analysis and Feedback (OEAF), publisher of the Operating Experience Weekly Summary, has established a home page (figure 1-1) on the Internet. The home page is located at http://tis.eh.doe.gov/web/oeaf.

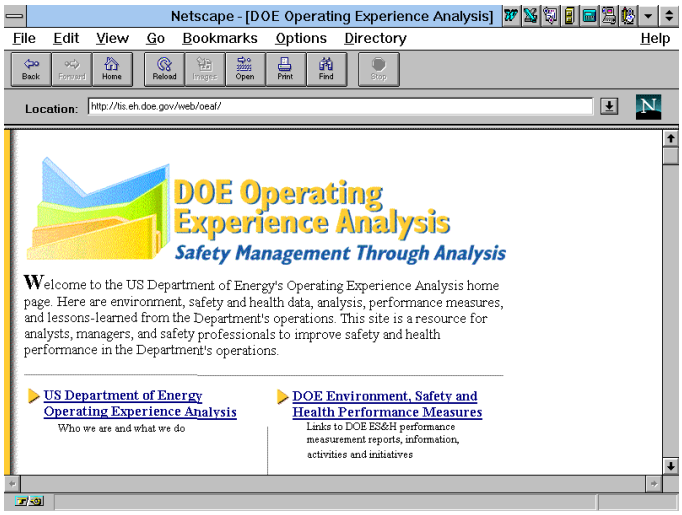

Figure 1-1. Partial View — OEAF Home Page

The OEAF home page provides data, products, ideas, and Internet links for safety professionals, managers, and analysts and is intended to serve a wide audience. Following are brief descriptions of the primary links.

- **US Department of Energy Operating Experience Analysis** — A "welcome" and a brief description of who we are and what we do.

- **DOE Environment, Safety and Health Performance Measures** — DOE Environment, Safety and Health quarterly performance indicator reports and links to related information, activities, and initiatives. This is also the gateway to Secretarial Office and Site data, Performance Based Management — SIG (Special Interest Groups) activities and products, and DOE documents on performance measurement.

- **DOE Operating Experience Data, Analysis Tools, and Information** — A gateway to the Occurrence Reporting and Processing System, links to many other sources of data, and tools to help analysts.

- **DOE Operating Experience Analysis and Lessons-Learned** — Current and archived Operating Experience Weekly Summaries, Safety Notices, and links to other lessons-learned sites. A search engine is also provided for on-line searching of the Weekly Summaries (figure 1-2).

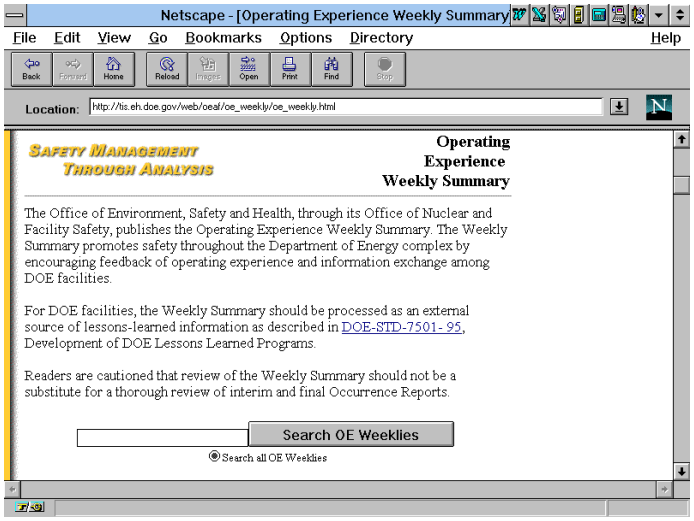

Figure 1-2. OE Weekly Summary Search Screen

OEAF staff members welcome user feedback and are continuously seeking new sources of analysis information, new analytical tools, and related site links. If you have ideas about how we can improve our products, suggestions for useful links, or other information you would like to share, please call us at (202) 586-7449 or fax the information to (202) 586-7330. You may also submit your comments and suggestions on an electronic comment form (figure 1-3) that is available through a link at the bottom of each page on our site.

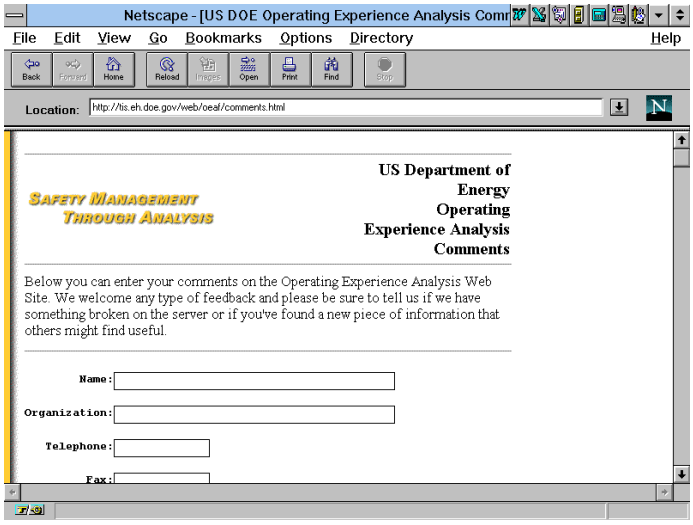

Figure 1-3. Partial View — Electronic Comment Form